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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/993,208	11/16/2001	Jinbao Jiao	AP01979	8084

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MOTOROLA, INC.  
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SCHAUMBURG, IL 60196

EXAMINER
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AFTERGUT, JEFF H

ART UNIT	PAPER NUMBER
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1733

DATE MAILED: 11/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/993,208

Applicant(s)

JIAO ET AL.

Examiner

Jeff H. Aftergut

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5, 7, 10-12, 21-23 and 26-28 is/are pending in the application.
- 4a) Of the above claim(s) 11, 12, 27 and 28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 10, 21-23, 26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

***Claim Rejections - 35 USC § 103***

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-5, 7, 10, 21-23 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klosowiak et al '418 in view of Stopperan, Griffin et al and either one of "Chipbonding Adhesive"(from Rubber world cited by applicant on 1449) or "Dual Cure System Adhesives" (from Adhesives Age also cited by applicant) and either one of Li et al or Klosowiak et al '362 .

Klosowiak et al '418 is cited for the same reasons as previously set forth in paper no. 5, paragraph 6. the reference was silent as to the specific adhesive employed to join the rigid member to the flexible board. The references to Stopperan and Griffin et al clearly envisioned that those skilled in the art would have joined a flexible board to a rigid board with a thermosetting adhesive material. the applicant is again referred to paper no. 5 for a complete discussion of these references. While the reference to Stopperan suggested that one skilled in the art would have applied a conductive adhesive in the manner recited by applicant, the reason the reference employed an electrically conductive adhesive was because there was a need for electrical contact between the rigid board and the flexible board. Having said that, one skilled in the art of joining a rigidizer would have readily appreciated that there was no need for an electrical connection between the flexible circuit and the rigidizer as such would likely result in short circuit of the assembly and would have been led to perform the same joining operation without the conductive material within the adhesive. The reference to Griffin as described in paper no. 5 clearly suggested that those versed in the art would have known to join the flexible

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board to the rigid member with a thermosetting adhesive which did not incorporate electrically conductive material therein. The applicant is advised that one skilled in the art at the time the invention was made would have readily appreciated that Klosowiak et al '418 did not need the conductive particles in the adhesive to make the joint and that the reason that Stopperan incorporated the conductive particle therein was to make an electrical connection between the flexible board and the rigid board in the region where the joint was formed. The reference to Griffin clearly shows that those skilled in the art would have recognized that the joint between a flexible board and a rigid board would have taken place without necessity of the conductive material in the adhesive when an electrical connection was not needed. Clearly, exclusion of the conductive material from the adhesive material of Stopperan along with its known function would have been within the purview of the ordinary artisan. The applicant is additionally advised that the specific properties of the adhesive for joining materials to boards was known per se as evidenced by Chipbonding Adhesive or Dual Cure System Adhesives. Clearly, those skilled in the art of adhesive bonding would have found it obvious to employ a dual cure adhesive to join a rigidizer to a flexible board in the manufacture of an assembly wherein the rigidizer acted as a heat sink. The references to either one of Chipbonding Adhesive or Dual Cure System Adhesives suggested that those versed in the art would have known to utilize the liquid adhesives which were subjected to b-staging in order to partially set the same followed by assembly and final cure. It should be noted that it would appear these are the same types of adhesives employed by applicant and that one skilled in the art would have utilized the same to attain a good bond. The references to Li et al or Klosowiak et al '362 are cited for the same reasons as previously given. To fold and/or bend the assembly of the rigidizer and the flexible board would have been within

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the purview of the ordinary artisan. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a dual cure adhesive such as that described by Chipbonding Adhesive or Dual Cure System Adhesives in the operation of joining a rigidizer to a flexible board as Klosowiak et al '418 suggested adhesive for formation of the bond and Stopperan and Griffin evidenced that such dual cure systems would have been useful in formation of a bond between a flexible board and a rigid member wherein after formation of the assembly the assembly was folded including the rigidizer as evidenced as an alternative to using separate plates for the rigidizer by either one of Li et al or Klosowiak et al '362.

#### *Election/Restrictions*

3. Claims 11, 12, 27, and 28 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 3.

#### *Response to Arguments*

4. Applicant's arguments with respect to claims 1-5, 7, 10, 21-23, and 26 have been considered but are moot in view of the new ground(s) of rejection.

The applicant argues that the reference to Stopperan is no longer available under 35 USC 102(b) as the claims have been amended to include more specific structure relating to the invention. This is well taken, as the reference to Stopperan is not joining a rigidizer which forms a heat sink to a flexible circuit board in the specific manner claimed and additionally does not

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expressly suggest the specified bending of both the flexible circuit and the rigidizer after assembly.

The applicant addresses the rejection under 35 USC 103 and states that the reference to Klosowiak et al '418 who is joining a rigidizer to a flexible circuit in the same environment as applicant failed to teach or suggest the specific adhesive joining techniques and that it would not have been obvious to one of ordinary skill in the art at the time the invention was made to look to the teachings of Stopperan. The applicant expressly states that the adhesive in Stopperan is a conductive adhesive which was used to make an electrical contact as well as a joint between a flexible board and a rigid board and that if one employed the conductive adhesive of Stopperan in Klosowiak et al '418 the assembly would short. The applicant is advised, that one skilled in the art at the time the invention was made would have known how to utilize the relevant teachings of the references and that the exclusion of a component of the adhesive and its resulting function would have been prima facie obvious, In re Larson, 144 USPQ 347, In re Kuhle, 188 USPQ 7, In re Keegan, 141 USPQ 512. certainly, one skilled in the art would have understood from Klosowiak et al '418 that a conductive adhesive was not needed and additionally from Griffin that a dual cure adhesive system would have been useful for joining a rigid board to a flexible board without the inclusion of a conductive adhesive. It would have been within the skill level of the ordinary artisan to omit the conductive particles of Stopperan in the operation described therein when it was desired to join a flexible board to a rigid board where no electrical connection was needed (such is the case for joining a rigidizer to a flexible board). Additionally, exclusion of the conductive particles would have made the operation cheaper (as the conductive particles add expense to the operation) and would have excluded the possibility of

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a short circuit in the arrangement. Lastly, one would have reasonable expected success when using the arrangement of Stopperan without the conductive particles therein for joining the rigid member to the flexible member as the reference to Griffin establishes that those would have achieved success. Applicant's argument that Stopperan employed a conductive thermosetting adhesive and thus would not have been led to practice the operation of Stopperan in Klosowiak et al '418 is therefore not persuasive when one considered the prior art as a whole.

With regard to the additional references applied, the applicant argues that these references do not make up for the deficiencies of the other references. This argument has not been found to be persuasive as addressed above there is no deficiency in the combination. The applicant argues that the references to Chipbonding Adhesive or Dual Cure System Adhesives do not relate to bonding a flexible board to a rigidizer but rather to joining components to a circuit board. Note that the flexible member is a flexible circuit board and therefore the references are relevant to the bonding operation. Additionally, while these references do not expressly state the operation of B-staging the resin (which would have intrinsically increased the viscosity of the resin and provided one with the identified properties as recited), the references are employing the same type of dual cure adhesives as applicant. Like materials would have been expected to act in a like manner.

Regarding the reference to Griffin, it is admitted that the reference did not specifically employ a liquid adhesive in association with the boards, however the reference did employ a dual cure resin (which was partially cured prior to association with the board materials and then finally cured after assembly). The reference was not cited for the manner of assembly, but rather to evidence that epoxy resins would have been useful for joining a flexible board to a rigid board

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in circuit board manufacture wherein the adhesive does not incorporate a conductive material in the adhesive.

***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff H. Aftergut whose telephone number is 703-308-2069. The examiner can normally be reached on Monday-Friday 6:30-3:00pm.

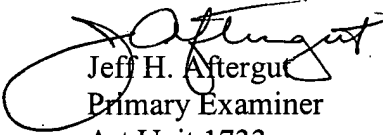
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on 703-308-3853. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

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Jeff H. Aftergut  
Primary Examiner  
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JHA

November 24, 2003